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THE EFFECT OF CORPORATE WATER DISCLOSURE ON FINANCIAL PERFORMANCE: EVIDENCE FROM SOUTH AFRICA

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Abstract:

The significance of corporate water disclosure must be considered. From a legitimacy theory perspective, this research evaluated the relationship between corporate water disclosure and the financial performance of 30 Johannesburg Stock Exchange (JSE) listed companies from 2017 to 2021. A quantitative study was adopted based on a longitudinal approach. The study's population involved all companies appearing on the JSE Responsible Investment Index in South Africa. As a result, 14 companies were sampled on the South Africa FTSE/JSE Responsible Investment Index. The findings indicate that financial performance indicators, namely return on assets, net profit margin, and earnings per share, had a significant positive relationship with corporate water disclosure. However, the findings exhibit that return on equity has a negative relationship with corporate water disclosure. Capital intensity was used as the control variable. It was inferred that to amplify return on assets, net profit margin, and earnings per share, JSE-listed companies should commit themselves to disclosing water-related initiatives and management. It acts as a source of motivation for companies that can increase financial performance by focusing on disclosing water-related issues.

Keywords: Corporate Water Disclosure, Johannesburg Stock Exchange, Financial Performance, Legitimacy Theory, Carbon Disclosure Project

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INTRODUCTION

The developing initiative of periodically revealing water management information is vital for corporates that use enormous quantities of water. It is essential to attain the Sustainable Development Goals (SDGs), especially those linked to water, SDG 6. The Economic Forum (2021) also concedes that water challenges have remained in the top 5 worldwide risks by impact since 2010. Hence, the United Nations (UN) (2021) further emphasizes that "water resources must be valued by recognizing, measuring, and integrating it into the decision-making process." It is because poor water administration contributes to tragic environmental and social challenges. It might disturb the operations of the business. Nonetheless, limited insight has been made available into the "economics of voluntary water disclosure at the corporate level" (Ali et al., 2020).

The corporate sector can no longer apply water resources grounded on a "business as usual" mentality. Water stewardship is crucial for maintaining a steady and balanced supply of water resources. Specifically, water-sensitive sectors such as mining and drinks and beverages industrial sectors face pressure from various stakeholders. For instance, on the supply side, the industrial sectors require the quality and quantity of water resources to be stable and the prices to be fixed at a sound level (UN, 2021). On the demand side, they are anticipated to show the efficacy of their water stewardship and adopt the highest standards to lessen the corporate's ecological impacts (Agyemang et al., 2021). As a result, organizations have apprehended that water-linked challenges might affect financial performance if they are not appropriately addressed.

Therefore, corporate water disclosure is essential to corporations and sustainability. Corporate water disclosure is broadly recognized as a significant element of corporate sustainability. Therefore, water disclosure remains a sustainability initiative within the corporate sector (Ali et al., 2020). Principally, organizational water disclosure is intended to make valuable monetary or material information about a corporate's water resources management undertakings available to stakeholders. Liu et al. (2021) report that water disclosure is integrated into sustainability reporting under natural capital. It enables the corporate sector to detect the pros and cons of water activities for an organization. Water disclosure is a component of environmental accounting. Water disclosure can be explained as embracing a regular and structured approach to establishing, quantifying, and reporting water resource information (Zheng et al., 2022). Corporate water disclosure is a reasonably new concept to "operationalize sustainability goals." However, the influence of water disclosure on corporate financial performance is significant but needs more research, particularly in South Africa, and contemporary empirical literature offers mixed results. Hence, Liu et al. (2021) and Zheng et al. (2022) acknowledge that the impact of water disclosure on financial performance is still poorly understood. Okegbe and Ofurum (2019) have attributed this to environmental accounting being a relatively new concept in emerging markets such as South Africa. Therefore, this paper is a timely extension of research on environmental accounting.

Against the above-cited backdrop, this research aims to empirically analyze the impact of corporate water disclosure on the financial performance of Johannesburg Stock Exchange (JSE)-listed companies. This research contributes to the manifold. For instance, the paper enhances the environmental information disclosure construct by critically focusing on water disclosure which has been ignored in contemporary literature yet is critically vital if sustainability is to be achieved. The argument is that accomplishing corporate water disclosure can aid companies in reducing water consumption and, therefore, lower water bills. The research also applies a multi-dimensional model of corporate water disclosure, which integrates ten objects of corporate water disclosure espoused by the Carbon Disclosure Project (CDP). It still needs to be present in contemporary literature in South Africa.

Literature Review. Recent research by Ali et al. (2020) found a positive link between water disclosure and financial performance covering five years from 2014 to 2018 for CDP Water A-List companies. Financial performance was proxied by "earnings per share" and "average share price." From this, it is clear that corporate water disclosure unlocks significant financial gains for companies. Ali et al. (2020) posit that water disclosure may assist organizations in reducing costs by lessening water bills, thereby mainly contributing to profitability. That water disclosure is responsible for reducing water usage through pressure from interested parties.

Liu et al. (2021) investigated the effect of water disclosure on financial reporting quality in China. The research's results indicate that water disclosure indirectly influenced financial reporting quality. Additionally, Liu et al. (2021) highlighted that water disclosure has substantial cost benefits, which amplify corporate financial performance. Companies that embark on water disclosure are more often than not likely to be subjected to internal and external pressure to rationally use the water (Liu et al., 2021). It helps investors to arrive at prudent investment decisions.

Zheng et al. (2022) contended that water disclosure upswings stakeholders' views on companies' green strategy. It enhances the firm's value, improving demand for its shares and goods and services. Contemporary literature relates enhanced firm value to more excellent financial performance. A company that commits itself to severely investing in water disclosure can attain green reliance from its customers and suppliers. Applying data from Chinese listed companies from 2016 to 2020, Zheng et al. (2022) disclose that water disclosure and financial performance are negatively associated. The study further identified that this relationship varies between state-owned

and non-state enterprises. It shows that commitment to water disclosure can be costly to the company. Therefore, these costs may be greater than the gains of water disclosure, culminating in losses in the short run.

In a study focusing on 170 companies listed on the Ho Chi Minh Stock Exchange in Vietnam, Khuong et al. (2022) discovered that corporate water disclosure positively influences the value of the listed companies. It suggests that water disclosure is directly linked with corporate governance and performance. As a result, investors are more interested in companies thoroughly disclosing their water management strategies and initiatives.

Based on the existing environmental literature, it can be demonstrated that empirical studies on corporate water disclosure are scarce. Specifically, studies investigating the nexus between corporate water disclosure and financial performance are rarer. However, only some studies on the relationship between corporate water disclosure and financial performance have provided mixed findings. Therefore, the nexus between water and financial performance remains to be seen and conclusive. Ali et al. (2021) attributed the inconsistent conclusions to applying different research variables and measurement methods. Considering the above continuing debate, a need exists for new empirical research to address the contradictory nature of results (Ali et al., 2020).

Theoretical Background, Legitimacy Theory. Legitimacy theory is among the highly persuasive concepts in the research of corporate environmental reporting (Al-Waeli et al., 2021). For corporations, demonstrating environmental care is a foundation of legitimacy. For that reason, Boakye (2018) argue that corporations apply education and data to inspire or explain their performance to develop corporate identity and amplify corporate performance. Considering the above behaviors, they aim to communicate a legitimate image through a commitment to ecological conservation or compliance with regulations. It eventually narrows the legitimacy gap between actual performance and the social prospects of the company. According to legitimacy literature, legitimacy is central to the long-term survival of a company, and it is primarily influenced by society.

So, legitimacy theory proposes that companies persistently seek to confirm that they work within the periphery of their particular society's norms. To this end, companies will try to present their business activities aligned with recognized behavioral norms in broader social systems (Khuong et al., 2022). In other words, companies must institute legitimacy within the bounds and norms broadly acknowledged in society. Contemporary researchers (Martinez, 2015; Igbekoyi et al., 2021) have highlighted that environmental conservation is a powerful legitimacy strategy. Companies will adopt legitimacy as an indicator to convey a "public image" and align their primary objectives with the image to evade instigating social or ecological challenges. In this case, legitimacy can contribute to an excellent reputation, improved profitability, and lower risks. In summary, legitimacy focuses on the company-society relationship that gets "social support for the company." It is perceived as one of the triggers for businesses to reveal ecological data to interested parties.

Hypothesis Development. The legitimacy theory's fundamental notion is that an organization's survival and success is hinged on legitimacy from society. With society's legitimacy, an organization's business activities remain sustainable. Igbekoyi et al. (2021) assert that by adopting initiatives that meet society's environmental needs, corporates can upswing their ethical bottom line. Additionally, through ecological-linked activities and information disclosure, organizations may bring valuable information to society while improving corporate financial performance.

Corporate water disclosure can upsurge corporate information transparency, which may decrease information asymmetry between companies and societies. It increases corporate financial performance (Wang et al., 2021). Al-Mawali (2021) submits that information asymmetry is vital for earnings management. Al-Mawali (2021) said that if corporate managers and society acquire the

same information, the company can only manipulate financial reports with society's discovery. Therefore, the higher the corporate water disclosure, the higher the financial performance. Indeed, Ali et al. (2020) noted that corporate environmental information disclosure may assist in upsurging corporate transparency. Based on Al-Tuwaijri et al. (2014), this increases corporate visibility and financial performance. Bearing that organizations liable for intensive water consumption face greater attention from society, they would put more effort into making available high-quality water disclosure to acquire legitimacy.

Organizations that disclose more information about their water usage tend to have a better financial standing. As discussed earlier, corporate behavior is directly related to corporate financial performance. Al-Waeli et al. (2021) agree that organizations with improved corporate social responsibility performance display better and constant earnings growth levels than organizations with poor corporate social responsibility performance. The disclosure of water information ought to portray the organization's good social image, noble corporate performance, robust ecological conservation capability, and readiness to conduct social responsibility (Aslam et al., 2020). Moreover, this can stimulate confidence in external investors, increasing corporate financial performance.

Despite the inconclusiveness of current results, this research paper argues that in a bid to attain legitimacy from society, companies increase their corporate water disclosure. It ultimately leads to an upsurge in the financial performance of companies. Companies can enjoy a better reputation when perceived to be highly committed to ecological conservation. Additionally, this paper's authors believe quoted corporates can get green trust from green-focused interested parties, improving their shares' price. Therefore, corporate water disclosure can be used as a proactive way of resolving the water crisis in South African companies while enhancing their image and improving society's view.

In this paper, we analyze the effect of corporate water disclosure on financial performance. Only some studies offer straight answers to this study's question. Empirical findings by Ali et al. (2020) have accepted that corporate water disclosure is positively associated with financial performance. Because of that, we anticipate that the better corporate water disclosure, the better financial performance. Therefore, bearing in mind the above discussions, it is hypothesized that:

H1: Corporate water disclosure and return on equity (ROE) have a positive significant relationship with companies listed on JSE.

H2: Corporate water disclosure and earnings per share (EPS) has a positive significant relationship with companies listed on JSE.

H3: Corporate water disclosure and return on assets (ROA) have a positive significant relationship with companies listed on JSE.

H4: Corporate water disclosure and net profit margin (NPM) have a positive significant relationship with companies listed on JSE.

METHODS

This study focuses on all FTSE/JSE listed companies. The researchers chose a longitudinal research approach. Boakye (2018) views a case study as an evaluation of the problems "targeted set of organizations that are perceived to possess the characteristics of the problems being investigated." All companies quoted on JSE were part of the population of the study. The decision to use JSE-listed companies was based on the fact that these are importantly examined of sustainability commitment and reporting.

Sample Determination. This sample relates to 30 companies listed on the FTSE/JSE Responsible Investment Index. These companies must disclose their environmental, sustainability, and governance issues per international standards (Doorasamy, 2015). It led to 150 company-year observations. The study covered the period from 2017 to 2021. The FTSE/JSE Responsible Investment Index was created from the combination of the JSE and the FTSE Russell in June 2015 to stimulate supportable behavior among quoted companies. Such an incredible partnership was developed owing to the increasing call for accountable investing. So, the partnership between the JSE and the FTSE Russell is meant to improve "environmental, social and governance" matters among listed companies and present investors with comprehensive data for them to factor in when making fundamental business decisions. The FTSE/JSE encompasses two indices, namely J113 and J110. The J113 involves all companies eligible for the "FTSE/JSE Responsible Investment Index" marked at 2.0 or greater and whose market caps are analyzed daily.

Conversely, the J110 involves the top 30 companies prosperous regarding environmental, social, and governance. Therefore, this paper used the top 30 FTSE/JSE companies as an appropriate sample for this research. The "FTSE/JSE Responsible Investment Index" companies demonstrated active involvement in sustainability practices such as detailed environmental information disclosure. Furthermore, they have fulfilled the FTSE and JSE's reporting necessities. This list was valuable in this research since it is updated two times per annum, namely in June and December. It helped the researchers to access all the data needed to test the research hypotheses. It resolved the missing data, which commonly creates problems in research (Aslam et al., 2020). To be incorporated into the sample, the company had to fulfill the following conditions;

1. The company is listed on the "FTSE/JSE Responsible Investment Index."
2. The company should be dynamically considering water disclosure for the past five years.
3. The company's environmental reports consist of the information needed for the research.

Alternatively, all recently listed JSE companies were disqualified from the sample. The companies were left out because they did not fall within the interval standards, and the data needed may need to be revised, which might harmfully influence the final findings. Of the 30 sampled companies, eight belonged to the mining sector and 6 to the manufacturing sector. Therefore, this study used 30 companies from the mining and manufacturing sector due to their use of large quantities of water during their operations. The ecological plans of these listed companies are formed about the "Environmental Conservation Act 73 of 1989," which intensely inspires ecological conservation while discouraging ecological impacts. It, with the combination of the listing requirements of the FTSE/JSE Responsible Investment, affects the ecological strategies and guidelines of the listed companies. The companies quoted on the FTSE/JSE index make available a better source to gather data from as the researchers are assured of quality results and a fair depiction of the position of water disclosure among listed companies as more than one sector was used.

Data Collection. This research applied secondary data in the form of annual and sustainability reports of companies listed on the JSE. It is because data sourced from these companies are subjected to intense auditing to upsurge transparency. Secondary data is extensively applied in research relating environmental information disclosure to financial performance. Financial performance data such as ROA, ROE, and EPS were gathered from the McGregor database and companies' annual financial statements from 2017 to 2021. Corporate water disclosure data was extracted from annual integrated reports and environmental and sustainability reports of the JSE-listed companies. Quantitative content analysis was adopted to gather data linked to corporate water disclosure indicators such as total water withdrawal volumes. Quantitative content analysis was inspired by the absence of data linked to the quantities of each component of corporate water disclosure, such as physical water risks and water-related business impacts.

In contrast to identical financial performance indicators, corporate water disclosure variables such as water opportunities linked to products and water recycling are still intuitively disclosed in environmental and sustainability reports of companies in South Africa. There needs to be more consistency and standardization in disclosing these proxies. Some companies apply quantitative approaches, while others disclose these metrics using a subjective approach. Hence, applying content analysis to translate the subjective data to quantitative data, the researchers, guided by the strict CDP guidance, established main search words for each indicator to identify whether the indicator was reported or not. It enabled a score to be allocated to each result. The researchers applied a scale between 0 and 1 for objectivity. During data collection, a score of 0 was assigned when the indicator was not reported in the annual report or the sustainability report, and a score of 1 was assigned when the indicator was reported in the annual report or the sustainability report.

Table 1: Operalisation of Variables

Variable	Description	Measurement
Wrel	Reporting or explaining that sufficient quantities of fresh water are "imperative" for operational purposes.	
Wacc	"Total water withdrawal volumes, total water consumption volumes, total	
	water discharge volumes, water recycling/reuse."	
Vwat	"Conducting their value chain on water-related issues."	
Bing	"Experienced detrimental water-related business impacts, Total financial	
	value of impacts, subject to enforcement orders, penalties, fines, and."	
WRA	"Any measurement used for water risk assessment, e.g., frameworks."	Represented by 1 if the company discloses and 0 if not
Wrisk	"Physical risks, regulatory risks, reputational risks, technological risks,	
	risks to value chain or direct operations, facilities at risks."	
Wop	"Realizing water-related opportunities, water opportunities relating to water efficiency, water opportunities relating to resilience, water opportunities relating to products and services, water opportunities	
	relating to markets."	
Gova	"Board-level oversight of water issues, a documented water policy or rules that are publicly available, water-related issues into long-term business objectives, water-related outcomes from climate scenario	
	analysis."	
Gwash	"Targets and goals monitored at the corporate level, setting Water, Sanitation & Hygiene (WASH) targets, setting water intensity reduction targets and supplier engagement targets."	
Rlink	"Recognised any linkages or trade-offs between water and other environmental impacts."	

Total Corporate Water Disclosure		The total water disclosure item (all of the above item)
CWD		
EPS	Earnings Per Share	Actual value
ROA	Return on Assets	Actual value
ROE	Return on Equity	Actual value
NPM	Net Profit Margin	Actual value

Note: “Wrel = Water reliance; Wacc = Water accounting; Vwat = Value chain; Binf = Business influence; WRA = Water risk assessment; Wrisk = Water risk; Wop = Water opportunity; Govs = Governance and strategy; Tgoal = Target and goals; Ltrade = Linkage and trade off; CWD = Corporate Water Disclosure”

Data Analysis, Control Variables. It is vital to establish if other fundamental factors impact the dependent variable. Hence, the factors must be evaluated preceding the independent variables to offer another description of the results. Control variables such as company size and leverage were adopted in related studies. It stems from the fact that the size of the company and leverage impact the company's total financial performance. This study uses capital intensity as a control variable. Capital intensity is defined as the ratio of assets to sales. Companies with high capital intensity are projected to have better financial performance (Aslam et al., 2020). A high degree of capital intensity shows that a company finances growth prospects and is highly profitable than less capital-intensive companies.

Independent Variable (Water Disclosure). The study's independent variables were elements of corporate water disclosure, as depicted in Table 1. These were derived from the CDP guideline. The CDP Water list has also been used by scholars such as Ali et al. (2020).

Dependent Variable (Financial Performance). Financial performance is an interaction among an organization's attributes, actions, and environment based on economic outcomes. Current research studies on environmental disclosure and financial sustainability nexus have applied various proxies of financial sustainability without a standard agreement on appropriate measures of financial sustainability (Zheng et al., 2022). Even so, the wide variety of financial sustainability measures cascades into two classes, namely accounting-based (profit) and market-based measures (share prices). At the same time, market-based measures analyze investors' evaluation of the corporate’s long-term profitability based on contemporary management practices (Chaudhry et al., 2020). At the same time, market-based measures analyze investors' evaluation of the corporate’s long-term profitability based on contemporary management practices (Igbekoyi et al., 2021).

Accounting-based measures are grounded on the company’s financial statements and reveal the company's valuation from the statement of financial position. Accounting-based methods are the principal measure of financial performance and concentrate on how companies return to different managerial decisions. They remain popular due to simple accessibility and data availability, particularly for publicly listed companies. However, Al-Mawali (2021) criticize the accounting-based measures in that they lean towards short-term performance and are open to manipulation by managers in choosing accounting methods or policies. The most popular measures of accounting-based approaches previously used in the environmental-financial performance link include EPS, ROA, and ROE.

Dependent Variable 1: Earnings per share show “much money a company makes for each share of its stock” (Wang et al., 2021). EPS is an indicator for quantifying corporate value. A greater EPS specifies higher value since investors will invest more in a company's shares if they assume it

enjoys greater profits than its share price. EPS is calculated by dividing total earnings by outstanding shares.

Dependent Variable 2: Return on assets is a form of profitability ratio that indicates “how much profit a company can generate from its assets” (Chaudhry et al., 2020). Simply put, ROA portrays how effective is a corporate’s management in realizing profit based on their assets. A higher percentage of ROA exhibits a more effective strategy in managing the company’s balance sheet to produce profits (Liu et al., 2021). It means that companies with low ROA usually possess more assets in producing profits and vice versa. ROA is mainly net income divided by average assets.

Dependent Variable 3: Return on equity measures financial performance quantified by dividing net income by shareholders' equity. ROE measures a company's profitability of shareholders' equity (Liu et al., 2021). It means that ROE provides insight into how the company controls the resources that shareholders have contributed to it. A higher ROE denotes that a company is efficient in producing income and growth based on its equity financing.

Dependent Variable 4: Net profit margin is calculated by dividing net profit by revenue times 100. It helps to identify a percentage of total income that is profit. NPM indicates the profit produced from every R1 in sales after deducting all overheads linked to earning those revenues.

Model Specification

$$FPit = \alpha + \beta CWDit + Xiti + it$$

Where: $i = 1, 2, \dots, 14$ (where i represents 14 listed companies under attention); $t = 1, 2, 3, 4, 5$ (where t is the 5 years under attention from 2017 to 2021); FP: Financial performance of listed company i at time t , measured by ROA, ROE, NPM, EPS; CWD: The total of water disclosure item; X is control variable; it : random error value.

RESULT AND DISCUSSION

Table 2: Correlation Analysis

Variables	1	2	3	4	5	6
1 CWD	1.000	.225	.176*	-.320	-.226	-.432
2 CapInt	.332	1.000	.874**	-.443*	-.214	-.112
3 EPS	.437*	.998**	1.000	-.321	.032	.115
4 ROE	-.541	-.228*	-.112	1.000	.334**	.652**
5 ROA	-.665**	-.012	.032	.556**	1.000	.776**
6 NPM	-.421**	-.117	.165	.650**	.884**	1.000

* **Indicate $p < .05$ and $p < .01$

The Spearman correlation coefficient is depicted in Table 2. Concerning Table 2, CWD (Corporate water disclosure) exhibits a positive significant association with EPS ($r = .437, p < .05$), ROA ($r = -.665, p < .01$), and NPM ($r = -.421, p < .01$). This lead to accepting the hypotheses (H2, H3, and H4) that there is a positive significant relationship between corporate water disclosure and financial performance (EPS, ROA, and NPM) of companies listed on JSE. Ensuring water management strategies and initiatives are appropriately disclosed can improve financial performance. Another financial performance indicator, ROE, displayed a non-significant relationship with CWD. It underscores that H1 is rejected and not supported. CWD is the sampled

companies' total quantity of water-associated information in the annual reports. With particular reference to the results of this study, we can deduce that corporate water disclosure components such as revealing total water consumption volumes and water recycling improves the financial performance of listed companies when EPS, ROA, and NPM are considered. The consequence of this finding is that listed companies may upsurge their market value by financing and obliging with corporate water disclosure initiatives, as validated by the study results. It further confirms that companies can enhance financial performance by seeking legitimacy from society through disclosing environmental information, such as water disclosure. Thus, in this case, seeking legitimacy improves corporate financial performance.

CONCLUSION

This study overall identified a positive and significant nexus between corporate water disclosure and financial performance (ROA, NPM, and ROE). This relationship signifies that investors are interested in companies that proactively undertake and disclose water management initiatives. It implies that the emergence of corporate water disclosure as a sustainability initiative is essential for companies to consider it a source of improvement in financial performance. The research provides adequate evidence that corporate water disclosure is a source of corporate financial well-being. Hence, companies that actively finance water disclosure initiatives intending to reduce water consumption are on the verge of achieving more excellent corporate performance. It stems from the postulation that it is presently more critical than before to do well in ecological performance. For example, in South Africa, it is now compulsory for companies on the JSE to reveal their ecological effects and diverse approaches adopted to alleviate such. The "FTSE/JSE responsible investment index" has been developed to constantly analyze companies' environmental and social performance to demonstrate the importance of ecologically responsible behavior. The results of this research subscribe to current related research. For example, a study by Zheng et al. (2022) indicates that corporate water disclosure is essential in improving the financial performance of companies in China. It was supported by Ali et al. (2020), who acknowledge that water disclosure is positively associated with financial performance.

This study provides empirical evidence that the JSE-listed companies, in order to improve ROA, NPM, and EPS, need to disclose water-related issues. Additionally, the findings of this study further validate that companies need to be involved in extensive water commitment to amplify financial performance. However, future studies can develop and apply the index to measure corporate water disclosure. Also, upcoming research can examine the impact of slack resources, namely financial resources, on corporate water disclosure.

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